



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,614	03/16/2004	Deok-Hyung Lee	5649-1272	2903

7590 04/07/2006

Mitchell S. Bigel  
Myers Bigel Sibley & Sajovec, P.A.  
P.O. Box 37428  
Raleigh, NC 27627

EXAMINER

DICKEY, THOMAS L

ART UNIT	PAPER NUMBER
----------	--------------

2826

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/801,614

Applicant(s)

LEE ET AL.

Examiner

Thomas L. Dickey

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7,13-17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,13,17,19 and 20 is/are rejected.
- 7) ☒ Claim(s) 2,6,7 and 14-16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2826

## DETAILED ACTION

1. The amendment filed on 03/10/2006 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,5,13,17,19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by YUZURIHARA ET AL. (5,428,237).

A. With regard to claims 1,4, and 5 Yuzurihara et al. discloses a field effect transistor comprising a fin 1004 extending vertically from a bulk semiconductor layer substrate 1012, the fin 1004 including an upper portion 1080 remote from the substrate 1012 and opposing sidewalls that extend between the upper portion 1080 and the substrate 1012; a lower region 1021 (channel region, in that the channel forms there) in the fin 1004; a gate electrode 1023 adjacent the channel region 1021-and crossing over the fin 1004; an insulation layer 1014 disposed between the gate electrode 1023 and the semiconductor layer 1012 at a periphery of the fin 1004; a gate insulation layer 1022 interposed between the gate electrode 1023 and the fin 1004; and source/drain regions

Art Unit: 2826

1017/1030 formed at both sides of the gate electrode 1023, wherein the channel region 1021 at the upper portion 1080 of the fin 1004 is doped higher than sidewalls (sides of lower region 1021) of the fin 1004, a device isolation layer 1026 on the substrate 1012 including respective portions that extend to a respective opposing sidewall of the fin 1004 to define an opening in the device isolation layer 1026; and a punch-through stop-layer 1013 in the opening between the portions (note, figure 20, that only a part of punch-through stop-layer 1013 is between the portions; this arrangement is not prohibited by claim 1) of the device isolation layer 1026, the punch-through stop-layer 1013 having a higher doping concentration than the sidewalls of the fin 1004 in the channel region 1021. Note figures 8,20,22, column 11 lines 3-13, and column 16 lines 10-57 of Yuzurihara et al.

**B.** With regard to claims 13 and 17 Yuzurihara et al. discloses a field effect transistor comprising a bulk semiconductor integrated circuit substrate 1012 including a region of a predetermined (P-type) conductivity type and a projection that defines a fin 1004 that projects away from the integrated circuit substrate 1012, extends along the integrated circuit substrate 1012 and includes a top 1080 that is remote from the integrated circuit substrate 1012 and opposing sidewalls (sides of the lower region 1021) that extend between the top 1080 and the substrate 1012; a lower region 1021 (channel region, in that the channel forms there) in the fin 1004 that is doped the predetermined (P-type) conductivity type, said fin 1004 having a higher doping concentration of the

Art Unit: 2826

predetermined (P-type) conductivity type adjacent the top 1080 than remote (down in lower region 1021) from the top 1080; a source region 1017 and a drain region 1030 in the fin 1004 on respective opposite sides of the channel region 1021; and an insulated gate electrode 1023 that extends across the fin 1004, adjacent the channel region 1021, a device isolation layer 1026 on the integrated circuit substrate 1012 including respective portions that extend to a respective opposing sidewall of the fin 1004 to define an opening in the device isolation layer 1026; and a punch-through stop-layer 1013 in the opening between the portions (note, figure 20, that only a part of punch-through stop-layer 1013 is between the portions; this arrangement is not prohibited by claim 13) of the device isolation layer 1026, the punch-through stop-layer 1013 having a higher doping concentration of the predetermined (P-type) conductivity type than the channel region 1021 remote from the top 1080. Note figures 8,20,22, column 11 lines 3-13, and column 16 lines 10-57 of Yuzurihara et al.

**C.** With further regard to claims 19 and 20 Yuzurihara et al. further discloses that the device comprises a capacitor 1041' connected to the source region and a bit line 1003' connected to the drain region. Note figure 13 and column 12 lines 32-54 of Yuzurihara et al.

Art Unit: 2826

***Allowable Subject Matter***

3. Claims 2,6,7, and 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

4. Applicant's arguments with respect to claims 1,4,5,13,17,19, and 20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

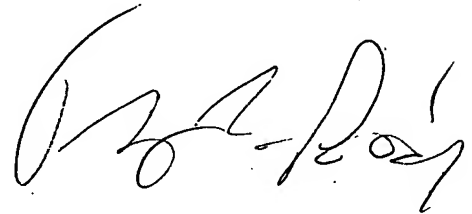
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2826

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thomas L. Dickey', is positioned above the printed name and title.

**Thomas L. Dickey**  
**Patent Examiner**  
**Art Unit 2826**  
**04/06**